UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,432	02/27/2004	Aaron D. Peacock	UTR.107X	8113

23557 7590 06/23/2010

SALIWANCHIK LLOYD & SALIWANCHIK
A PROFESSIONAL ASSOCIATION
PO Box 142950
GAINESVILLE, FL 32614

EXAMINER	
SALMON, KATHERINE D	

ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
06/23/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

euspto@slspatents.com

Office Action Summary	Application No.	Applicant(s)	
	10/788,432	PEACOCK ET AL.	
	Examiner	Art Unit	
	KATHERINE SALMON	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-14,16-23,25-31 and 34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-14,16-23,25-31 and 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the papers filed on 3/15/2010.

2. Claims 1-6, 8-14, 16-23, 25-31 and 34 are pending. Claims 7, 15, 24, and 32-33 have been cancelled.

3. The following rejections are reiterated or newly applied as necessitated by amendment.

4. It is noted that the applicant requested an interview on p. 7 4th paragraph of the reply. However, based on time constraints an office action is set forth below. Applicant is encouraged to call the examiner to set up an interview once the office action has been received and reviewed.

5. This action is FINAL.

Withdrawn Rejections and Objections

6. The claim objections made in section 8 of the previous office action is moot based upon amendments to the claims.

7. The rejection of the claims under 35 USC 112/New matter is moot based upon arguments for claim 31 pointing to the description in the specification and the cancellation of Claims 32-33.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-6, 8-14, 16-18, 21-22, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p. 1015) in view of Peyton et al. (US Patent 5641642 June 24, 1997) and Boschker et al. (Nature April 1998 Vol. 392 p. 801).

With regard to Claim 1, Arao et al. teaches a method of detecting at the site changes in soil bacteria and fungal activities (e.g. bioremediation) by measurement of the incorporation of ^{13}C into phospholipids fatty acids (PLFA) abstract). With regard to step a, Arao et al. teaches contacting a community at a soil site with ^{13}C labeled acetate

(p. 1016 1st column last two paragraph). With regard to step c, Arao et al. teaches identifying biomarkers (e.g. phospholipids) in which the ^{13}C label was incorporated (p. 1016 1st column last two paragraphs and 2nd column 2nd full paragraph). With regard to step d, Arao et al. teaches the measurement of PLFA indicates microbial growth in the soil (1st paragraph) and therefore indicates that detection of microbes known to cause bioremediation because the presence of bacteria and fungi in the soil indicate that the soil sample contains living organisms (p. 1016 3rd paragraph).

With regard to Claims 2-3, Arao et al. teaches that the biomarkers are phospholipids (abstract).

With regard to Claims 4-5, Arao et al. teaches that the detection of these fatty acids are found in Gram-negative bacteria and only a small amount of Gram-positive bacteria therefore the biomarkers would detect a subset of microbial organisms (p. 1018 1st column last paragraph).

With regard to Claim 6, Arao et al. teaches the isotope of ^{13}C (abstract).

With regard to Claim 8, Arao et al. teaches a method of identification of PLFA analysis (abstract).

With regard to Claim 9 step a, Arao et al. teaches contacting a community at a soil site with ^{13}C labeled acetate (p. 1016 1st column last two paragraph). With regard to step c, Arao et al. teaches identifying biomarkers (e.g. phospholipids) in which the ^{13}C label was incorporated (p. 1016 1st column last two paragraphs and 2nd column 2nd full paragraph). With regard to step d, Arao et al. teaches the measurement of PLFA

indicates microbial growth in the soil (1st paragraph) and therefore indicates that detection of microbes.

With regard to Claims 10-11, Arao et al. teaches that the biomarkers are phospholipids (abstract).

With regard to Claims 12-13, Arao et al. teaches that the detection of these fatty acids are found in Gram-negative bacteria and only a small amount of Gram-positive bacteria therefore the biomarkers would detect a subset of microbial organisms (p. 1018 1st column last paragraph).

With regard to Claim 14, Arao et al. teaches the isotope of 13C (abstract).

With regard to Claim 16, Arao et al. teaches a method of identification of PLFA analysis (abstract).

However, Arao et al. does not teaches a method of contacting the microbial community in subsurface site or down-well groundwater site with a sterile solid support that has be loaded with the 13C labeled acetate (step a) or incubating the solid support at the site for a period of time to establish a biofilm (step b).

With regard to Claims 1 and 9, Boschker et al. teaches a method of 13C labeling soil for PLFA analysis (p. 802 1st two paragraphs). Boschker et al. teaches that 13C can be directly injected into core samples from various sites of interest and that PLFA can be calculated (p. 804 1st column last paragraph). Therefore Boschker et al. teaches a method in which soil does not have to first be dried as in the method of Arao et al., but rather soil can be directly incubated with 13C. Therefore Boschker et al. indicates direct

detection can be performed rather that detection only after drying a sample. However, Boschker et al. does not teach that this direct detection can be performed on site.

With regard to Claim 1 and 9, Peyton et al. teaches a device which permits biofilm forming microorganism to adhere to packing material (e.g. solid support) in order to analyze the microorganisms at groundwater and subsurface sites (abstract and column 1 lines 15-25). Therefore Peyton et al. teaches a method wherein biofilms can be formed at the site of interest.

With regard to Claims 17-18 and 21-22, Peyton et al. teaches detection of microbes at groundwater or subsurface sites (column 1 lines 15-25).

With regard to Claims 25 and 28, Peyton et al. teaches that solid support comprises a perforated tube (Column 2 lines 10-11) which the acetate of Arao et al. would be loaded into in order to incorporate the 13C label into the sample.

With regard to Claims 26 and 29, Peyton et al. teaches that the tube comprises glass fibers or glass beads (column 2 lines 19-20).

With regard to Claims 27 and 30, Peyton et al. teaches incubating the tube for a period of time to establish a biofilm (abstract).

it would be prima facie obvious for one of skill in the art at the time of filing to modify the method of detecting biomarkers labeled with isotopes to detect microorganisms in soil samples as taught by Arao et al. to detect samples without first performing a drying step as taught by Boschker et al. and at the site of interest as taught by Peyton et al. The ordinary artisan would be motivated to detect at the site in order to determine the census of microbial growth at bioremediation sites in order to

accurately know the optimal nutrients for growing desired organisms at the site of interest (column 1 lines 23-27). The ordinary artisan would be motivated to detect samples at the site of interest in order to determine the level of PLFA at the site without additional drying steps. One of ordinary skill in the art would have been motivated to contact a microbial community at a subsurface site or down-well water site with a sterilized solid support coated with an isotope enriched surface by applying conventional methodologies. The methodology of growing and detecting biomarkers on an isotope enriched surface is known in the art by the teaching of Arao et al. It would have been obvious to combine Arao et al. with known methodologies of direct detection of soil samples and biofilm production at the site as taught by Boschker et al. and Peyton et al. with a reasonable expectation of success of producing a biofilm enriched with isotope in which the microbial community is contacted to at the site.

Response to arguments

The reply traverses the rejection. A summary of the arguments presented in the reply is set forth below with response to arguments following.

(A) The reply asserts that there is no teaching or suggestion that the substrates within the device of Peyton et al. could be or should be loaded with a labeled substrate upon with a biofilm could form and such a suggestion can not be gleaned form the teachings of Arao et al. or Boschker (p. 9 last paragraph). The reply asserts that Boschker et al. teaches the direct injection of 13C acetated into a soli sample (Boschker et al) or the addition of 13C acetate to soil (Arao et al.) (p. 9 last paragraph). The reply

asserts that neither reference teach that one should load a non-radioactively labeled substrate onto a packing material as taught by Peyton (p. 10 1st paragraph).

This arguments has been fully reviewed but have not been found persuasive.

Peyton et al. teaches a device which permits biofilm forming microorganism to adhere to packing material (e.g. solid support) in order to analyze the microorganisms at groundwater and subsurface sites (abstract and column 1 lines 15-25). Therefore Peyton et al. teaches a method wherein biofilms can be formed at the site of interest. The ordinary artisan would be motivated to detect samples at the site of interest in order to determine the level of PLFA at the site without additional drying steps. The reply seems to be asserting that the there would be no motivation to use this device as a support for the C13 labeled substrate of Arao et al. However, Peyton et al. teaches that current method of monitoring bioremediation requires large amounts of the groundwater to be recovered and analyzed whereas the method of Peyton et al can measure the accumulation rate in situ without the large collection of samples (column 1 lines 40-65). As such the ordinary artisan, without any secondary considerations, would be motivated to place the biofilm of Arao et al. in the device of Peyton et al. in order to measure the bioremediation at a site without the need to move samples to the laboratory.

(B) The reply asserts that Peyton et al. appears to discourage the use of a substrate on the packing material and points to the first paragraph of the introduction and the Example (p. 10 2nd through 4th paragraph).

This arguments has been fully reviewed but have not been found persuasive.

It is noted that the Example in Peyton et al. is only a embodiment, furthermore, Peyton et al. is combined with Arao et al. which teaches measuring changes in a cite by measuring the incorporations of an isotope into PLFA. Herein in the instant case, the example of Peyton et al. is measuring biomass concentrations and not measuring changes in a site. The first paragraph of the introduction teaches that an accurate census must be done before determination of bioremediation can proceed. Herein in the instant case, the use of the device of Peyton et al. would be the determination of bioremediation changes as suggested by Arao et al. and not the direct census method of Peyton et al. The reply has not provided any evidence that it would be unpredictable at the time of filing to use a insitu device, such as the one taught by Peyton et al, to measure the bioremediation change as suggested by Arao et al. Herein in the instant case, the ordinary artisan would be motivated to use an insitu device for the direct measurement of bioremediation at a site in order to reduce the number of samples taken to the laboratory.

This should not be construed as an invitation for providing evidence. As further stated in the MPEP 716.01 regarding the timely submission of evidence:

A) Timeliness.
Evidence traversing rejections must be timely or seasonably filed to be entered and entitled to consideration. In re Rothermel, 276 F.2d 393, 125 USPQ 328 (CCPA 1960). Affidavits and declarations submitted under 37 CFR 1.132 and other evidence traversing rejections are considered timely if submitted:

(1) prior to a final rejection,
(2) before appeal in an application not having a final rejection, *
(3) after final rejection **>, but before or on the same date of filing an appeal, upon a showing of good and sufficient reasons why the affidavit or other evidence is

necessary and was not earlier presented in compliance with 37 CFR 1.116(e); or

(4) after the prosecution is closed (e.g., after a final rejection, after appeal, or after allowance) if applicant files the affidavit or other evidence with a request for continued examination (RCE) under 37 CFR 1.114 in a utility or plant application filed on or after June 8, 1995; or a continued prosecution application (CPA) under 37 CFR 1.53(d) in a design application.

For affidavits or declarations under 37 CFR 1.132 filed after appeal, see 37 CFR 41.33(d) and MPEP § 1206 and § 1211.03.

(C) The reply asserts that one of skill in the art would understand that introducing excess nutrients on the sampler during census would alter the size and/or composition of the microbial community that localizes to the device of Peyton et al. and thus would render the census inaccurate, whereas, the claimed intention requires that the solid support be loaded or coated with an isotope enriched substrate (p. 10 last paragraph through p. 11 1st paragraph). The reply asserts that therefore the invention is incompatible with the purpose of Peyton et al. (p. 11 1st paragraph). The reply asserts that rather than attacking the reference individuals applicants have pointed out how a prima facie case of obviousness has not been stabled because the references in combination fail to teach contacting a microbial community at a subsurface site or down well groundwater site with a sterilized solid support loaded or coated with an isotope enriched substrate (p. 11 last paragraph). The reply asserts that the modification of Peyton et al. would render the device unsuitable for the method of determining an accurate census of the microbial population at a particular subsurface (p. 11 last paragraph to p. 12 1st paragraph).

This arguments has been fully reviewed but have not been found persuasive.

This argument is based upon the assertion that the device of Peyton et al. is only used for the census performed in the patent of Peyton et al. However, Peyton et al. teaches that many other analysis's may be performed on the device including identity of microorganisms, quantity of biomass, physiological state of biomass, total attached solids, volatile attached solids, protein concentration, nutrient requirement, growth rate (column 3 lines 15-20). Arao et al teaches a method of using a substrate to look for bioremediation changes. Herein in the instant case, the device of Peyton et al. would be used in the method of Arao et al. in order to measure bioremediation changes at the site. The reply has not presented any evidence or any secondary considerations that measuring bioremediation at the site was unpredictable. Boschker et al. teaches that soil can be directly detected for analysis and therefore it would be obvious to the ordinary artisan to use a device (Peyton et al.) that can sample directly at a site to measure the bioremediation of such a site using the biofilms of Arao et al.

(D) The reply asserts that there is no teaching that the biofilm in Arao et al. is directed to measuring the activity of soil bacteria (p. 12 2nd paragraph). The reply asserts that with regard to the teaching of Peyton to measure the accumulation rate of the bioremediation process, it is unclear how the office extends these teachings to the reference teaching that a census can be taken not only without the introduction of excess nutrients but also in the presence of excess nutrition when the reference teaches the use of sterile packing material that is not coated with a substrate in order to obtain an accurate census of a microbial populations (p. 12 2nd paragraph).

This arguments has been fully reviewed but have not been found persuasive.

Peyton et al. is combined with Arao et al. which teaches measuring changes in a cite by measuring the incorporations of an isotope into PLFA. Herein in the instant case, the example of Peyton et al. is measuring biomass concentrations and not measuring changes in a site. The first paragraph of the introduction teaches that an accurate census must be done before determination of bioremediation can proceed. Herein in the instant case, the use of the device of Peyton et al. would be the determination of bioremediation changes as suggested by Arao et al. and not the direct census method of Peyton et al. The reply has not provided any evidence that it would be unpredictable at the time of filing to use a insitu device, such as the one taught by Peyton et al, to measure the bioremediation change as suggested by Arao et al. Herein in the instant case, the ordinary artisan would be motivated to use an insitu device for the direct measurement of bioremediation at a site in order to reduce the number of samples taken to the laboratory.

10. Claims 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p. 1015) and Peyton et al. (US Patent 5641642 June 24, 1997) and Boschker et al. (Nature April 1998 Vol. 392 p. 801) as applied to Claims 1-6, 8-14, 16-18, 21-22, and 25-30 and in view of Alexandrino et al. (Applied and environmental Microbiology October 2001 Vol 67 p. 4796).

The combination of Arao et al, Peyton et al., and Boschker et al. teaches a method of contacting a microbial community at a subsurface or down well groundwater site with a solid support loaded with an isotope enriched substrate, incubating, and identifying biomarkers. However the combination does not teach labeling the biomarker with ^{2}H.

With regard to Claims 19 and 23, Alexandrino et al. teaches that ^{2}H can be used as a tracer for PLFA analysis (abstract).

Therefore it would have been prime facie obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Arao et al, Boschker et al., and Peyton et al. to include a label of ^{2}H on the biomarker for PLFA analysis as taught by Alexandrino et al. It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from a finite number of predictable isotope labels for the biomarker including ^{2}H with a reasonable expectation of success of labeling the biomarker in PLFA analysis for detection of the polylipids in the sample. Further Alexandrio et al. teaches that a use of ^{2}H for labeling is that there are a large number of compounds of ^{2}H available, the isotopes are less expensive, and the relatively low natural background of deuterium is beneficial for detection (p. 4796 2nd column 1st paragraph).

Response to arguments

A summary of the arguments presented in the reply is provided below with response to arguments following.

The reply asserts that the combination of Arao et al, Boschkeret al. and Peyton et al. does not teach a method for in situ use (p. 13 1st paragraph). The reply presents identical arguments as cited above (p. 13 1st paragraph).

These arguments have been fully reviewed but have not been found persuasive.

As discussed in the response to arguments section above, the combination of Arao et al. Peyton et al. and Boschker et al. teaches all the required limitations to the claims. Please see response to arguments in section 9 with regard to the response to the specific arguments set forth in the reply.

11. Claims 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p. 1015), Peyton et al. (US Patent 5641642 June 24, 1997) and Boschker et al. (Nature April 1998 Vol. 392 p. 801) as applied to Claims 1-6, 8-14, 16-18, 21-22, and 25-30 and in view of Kharlamenko et al. (Marine Ecology 2001 Vol. 220 p. 103).

The combination of Arao et al, Peyton et al., and Boschker et al. teaches a method of contacting a microbial community at a subsurface or down well groundwater site with a solid support loaded with an isotope enriched substrate, incubating, and identifying biomarkers. However the combination does not teach labeling the biomarker with ^{34}S.

With regard to Claims 19 and 20, Kharlamenko et al. teaches that ^{34}S can be used as a tracer for biomarkers (abstract).

Therefore it would have been prime facie obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Arao et al, Boschker et al., and Peyton et al. to include a label of ^{34}S on the biomarker for PLFA analysis. It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from a finite number of predictable isotope labels for the biomarker including ^{34}S with a reasonable expectation of success of labeling the biomarker in PLFA analysis for detection of the polylipids in the sample.

Response to arguments

A summary of the arguments presented in the reply is provided below with response to arguments following.

The reply asserts that the combination of Arao et al, Boschker et al. and Peyton et al. does not teach a method for in situ use (p. 13 2nd t paragraph). The reply presents identical arguments as cited above (p. 13 2nd paragraph).

These arguments have been fully reviewed but have not been found persuasive.

As discussed in the response to arguments section above, the combination of Arao et al. Peyton et al. and Boschker et al. teaches all the required limitations to the claims. Please see response to arguments in section 9 with regard to the response to the specific arguments set forth in the reply.

12. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p. 1015), Peyton et al. (US Patent 5641642 June 24, 1997) and Boschker et al. (Nature April 1998 Vol. 392 p. 801) as

applied to Claims 1-6, 8-14, 16-18, 21-22, and 25-30 and in view of Lytle et al. (Journal of Microbiological methods 2001 Vol. 44 p. 271).

The combination of Arao et al, Peyton et al., and Boschker et al. teaches a method of contacting a microbial community at a subsurface or down well groundwater site with a solid support loaded with an isotope enriched substrate, incubating, and identifying biomarkers. However the combination does not teach the isotope enriched substrate is an isotope enriched form of a contaminant present at the site, the isotope enriched substrate is a substrate that is more readily utilized by a bioremediation-capable microbial organisms than by a bioremediation-incapable microbial organism, or the utilization of the isotope enriched substrate by a bioremediation-capable microbial organism serves to facilitate bioremediation by said bioremediation-capable microbial organism.

With regard to Claims 31, Arao et al. teaches that PLFA from 13C acetate can be used to detect changes in soil bacterial and fungal activities (abstract).

With regard to Claim 31, Lytle et al. teaches a method of using 13C labeled gram negative bacteria as a tracer for bioremediation in the subsurface (abstract). Lytle et al. teaches a method of measuring 13C which replaces 12C (p. 272 2nd column 1st paragraph). Therefore with regard to Claim 31, Lytle et al. teaches the isotope is a form of the contamination present at the site. Lytle et al. teaches measuring 13C by PLFA (p. 279 2nd column 1st paragraph).

Therefore it would be prima facie obvious to one of ordinary skill in the art to modify the method of Arao et al. Peyton et al., and Boschker et al. to further includes a

measurement of gram negative bacteria which are used fro bioremediation of the subsurface. Arao et al. teaches that gram negative bacteria can be measured by PLFA (p. 1018 1st column last paragraph). Arao et al. teaches that measurement of PLFA indications the microbial growth in the soil (p. 1016 1st paragraph). As such it would be obvious to one of ordinary skill in the art to use the isotope enriched substrate utilized by bioremediation capable microbial organisms to facilitate bioremediation as taught by Lytle et al. The ordinary artisan would be motivated to further use the microbial organism to facilitate remediation as Lytle et al. teaches that these bacteria are good indicators of the progress of remediation (p. 279 2nd column 2nd paragraph).

Response to arguments

A summary of the arguments presented in the reply is provided below with response to arguments following.

The reply asserts that the combination of Arao et al, Boschker et al. and Peyton et al. does not teach a method for in situ use (p. 13 last paragraph). The reply presents identical arguments as cited above (p. 13 last paragraph).

These arguments have been fully reviewed but have not been found persuasive.

As discussed in the response to arguments section above, the combination of Arao et al. Peyton et al. and Boschker et al. teaches all the required limitations to the claims. Please see response to arguments in section 9 with regard to the response to the specific arguments set forth in the reply.

13. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p. 1015), Peyton et al. (US Patent 5641642 June 24, 1997) and Boschker et al. (Nature April 1998 Vol. 392 p. 801) as applied to Claims 1-6, 8-14, 16-18, 21-22, and 25-30 and in view of Kukor et al. (US Patent Application Publication 2002/0034421 March 21, 2002).

The combination of Arao et al, Peyton et al., and Boschker et al. teaches a method of contacting a microbial community at a subsurface or down well groundwater site with a solid support loaded with an isotope enriched substrate, incubating, and identifying biomarkers. However the combination does not teach the isotope enriched substrate is an polyaromatic hydrocarbon.

With regard to Claim 34, Kukor et al. teaches in order to isolate PAH degrading organism from a coal tar-contaminated soil sample, PAH solution was used as a substrate for enrichment purposes (paragraph 71 p. 6). As such Kukor et al. teaches that to isolate PAH degrading organisms from a sample a substrate with PAH had to be used.

Therefore it would have been prima facie obvious to one of ordinary skill in the art at the time of filing to modify the method of Arao et al, Peyton et al, and Boschkler et al. to use isotope substrates of PAH when determining the amount of PAH degrading organisms which are in a sample. Kukor et al. teaches that PAH can be used as a substrate and based upon the teaching of Arao et al., Peyton et al., and Boschkler et al it would be obvious to add an isotope to the PAH substrate in order to determine how much PAH degrading organisms are left in the soil sample by measurement of the

change in isotope level. Therefore the ordinary artisan would be motivated to use isotope enriched PAH in order to determine the bioremediation stage of a soil sample containment with coal and tar as suggested by Kukor et al.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KATHERINE SALMON whose telephone number is (571)272-3316. The examiner can normally be reached on Monday - Friday 9AM-530PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Nguyen can be reached on (571) 272-0731. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Katherine Salmon

/Sarae Bausch /
Primary Examiner, Art Unit 1634